ONTARIO MINISTRY OF ENVIRONMENT
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OPERATING SUMMARY

1968

OWEN SOUND

water pollution control plant

TD
367
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O94
1968
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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

TD
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O94
1968

Owen Sound : water pollution
control plant.

81782

Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 7
Ontario

We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.

DCaverly
D. S. Caverly,
General Manager.

DMcTavish
D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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135 St. Clair Avenue West
Toronto 7

OWEN SOUND

water pollution control plant

operated for

THE CITY OF OWEN SOUND

by the

ONTARIO WATER RESOURCES COMMISSION

1968 ANNUAL OPERATING SUMMARY

FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

CONTENTS

Title Page i

Foreword ii

'68 Review 1

Project Costs 2

Operating Costs 3

Process Data 5

Recommendations . . . . Inside back cover

'68 REVIEW

The total flow to the plant in 1968 was 1442.50 million gallons which gave an average flow of 4.0 mgd. This is an increase of 0.12 mgd over 1967, and is 1 mgd above the design capacity of the plant. The average BOD and suspended solids concentrations in the raw sewage were 125 mg/l and 314 mg/l. The suspended solids concentration was high, due in part to industrial waste.

The total operating costs for the year were $48,466.97, or $33.60 per million gallons.

Chlorination was carried out on a year round basis.

It appears that storm water run-off was the main cause of the heavy flows. During the latter part of 1968, steps were taken to increase the capacity of the west side sewage pumping station. This will heighten the high flow problem at the plant.

PROJECT COSTS

NET CAPITAL COST (Final)		$1,468,243.18
DEDUCT - Payments from Municipalities	$ 30,758.65	
- Portion Financed by CMHC-MDLB (Final)	996,392.74	1,027,151.39
Long Term Debt to OWRC		$ 441,091.79

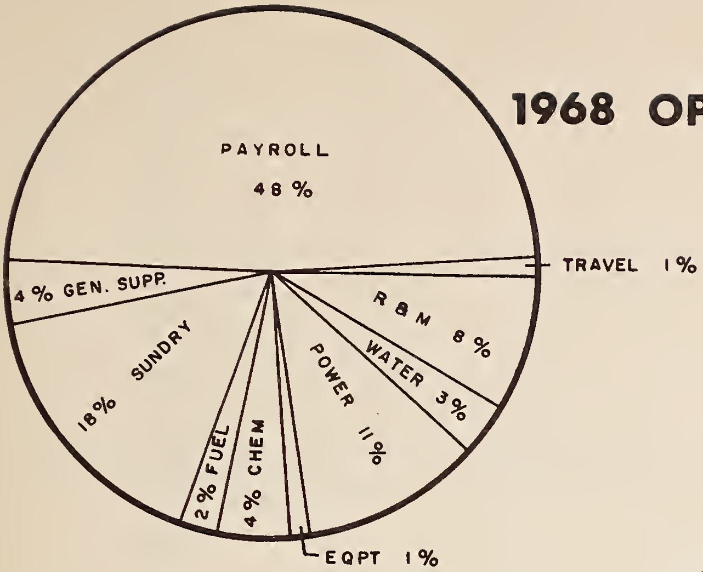
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968	$ 65,714.92

Net Operating	$ 48,466.97
Debt Retirement	8,883.00
Reserve	8,128.29
Interest Charged	24,732.29
TOTAL	$ 90,210.55

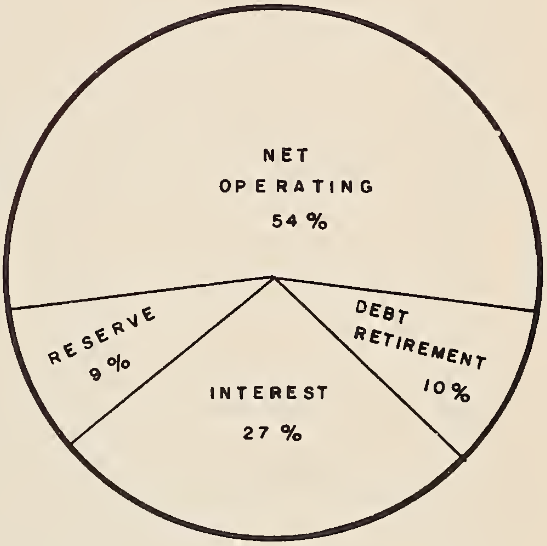
RESERVE ACCOUNT

Balance at January 1, 1968	$ 52,854.43
Deposited by Municipality	8,128.29
Interest Earned	3,094.14
	$ 64,076.86
Less Expenditures	6,859.11
Balance at December 31, 1968	$ 57,217.75

1968 OPERATING COSTS



TOTAL ANNUAL COST



Yearly Operating Costs

YEAR	M.G.TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1964	1147.207	$27,331.80	$23.82	3 cents
1965	1236.31	34,109.32	27.59	6 cents
1966	1166.20	36,736.62	31.52	6 cents
1967	1415.50	48,655.69	34.37	3 cents
1968	1442.5	48,466.97	33.60	4 cents

Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAY ROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER	TRAVEL
JAN	3671. 22	1716. 64	-	-	422. 02	-	75. 18	-	-	1367. 07	90. 31	
FEB	3452. 48	1591. 74	-	258. 80	448. 13	-	152. 15	-	687. 30	172. 05	99. 95	42. 36
MAR	5142. 60	2680. 24	-	99. 50	497. 25	-	161. 81	-	172. 42	1407. 30	97. 20	26. 88
APRIL	4281. 55	1697. 10	-	269. 05	487. 88	-	80. 51		623. 96	983. 31	109. 64	30. 10
MAY	5085. 72	1661. 98	-	79. 60	432. 19	-	151. 51	317. 86	1370. 15	921. 60	119. 87	22. 96
JUNE	2566. 05	1605. 79	-	79. 60	424. 17	23. 62	105. 71	-	205. 76	12. 75	89. 19	19. 46
JULY	2881. 42	1578. 38	-	-	447. 01	-	123. 87	-	116. 74	493. 53	92. 77	29. 12
AUG	3045. 74	2401. 44	-	-	442. 81	-	82. 00	-	63. 97	-	23. 74	31. 78
SEPT	2726. 73	1751. 96	-	-	408. 39	-	227. 98	128. 90	83. 22	66. 49	21. 99	37. 80
OCT	6216. 50	1610. 37	-	79. 60	402. 47	2145. 67	155. 06	-	119. 91	1486. 70	164. 46	52. 26
NOV	3459. 09	1369. 79	-	-	547. 29	-	124. 23	-	182. 50	904. 51	354. 17	76. 60
DEC	5937. 87	3322. 78	337. 47	217. 71	481. 55	-	253. 91	-	304. 54	723. 75	230. 31	65. 85
TOTAL	48466. 97	22888. 21	337. 47	1083. 86	5441. 16	2169. 29	1693. 92	446. 76	3938. 47	8539. 06	1493. 60	435. 17

*SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $6, 575. 63

Process Data

PLANT FLOWS and CHLORINATION

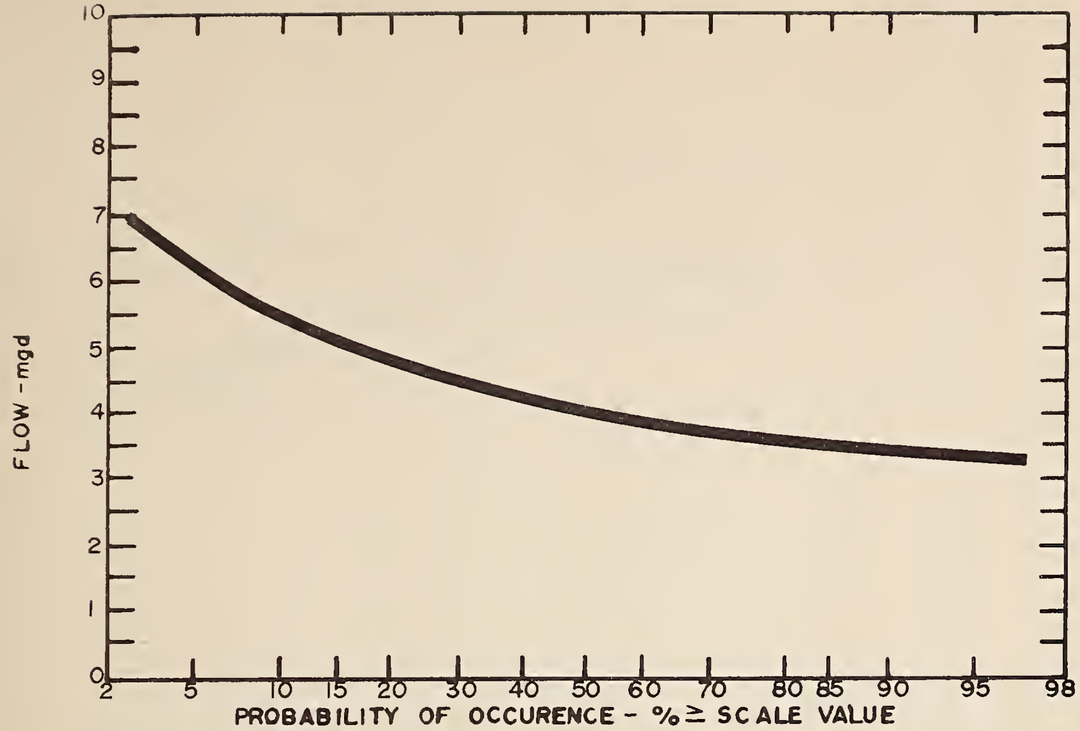
MONTH	TOTAL FLOW mg	AVERAGE DAILY FLOW mg	MAXIMUM DAILY FLOW mg	MINIMUM DAILY FLOW mg	CHLORINE USED 10^3 lbs.	DOSAGE mg/l
JAN	126.9	4.09	6.60	2.70	2.93	2.3
FEB	138.3	4.77	9.70	3.20	2.98	2.1
MAR	116.2	3.75	4.90	3.30	3.59	3.1
APR	120.0 *	4.00	o/s	o/s	2.91	-
MAY	106.0	3.42	5.70	3.30	3.06	2.9
JUN	80.9	2.70	4.50	3.10	2.43	3.0
JUL	102.6	3.31	4.00	3.00	1.44	1.4
AUG	136.4	4.40	9.40	3.00	2.62	1.9
SEPT	145.2	4.80	7.20	3.70	2.41	1.7
OCT	112.5	3.64	4.80	3.10	2.46	2.2
NOV	117.2	3.91	5.90	3.10	2.54	2.2
DEC	140.3	4.50	8.00	3.60	3.14	2.2
TOTAL	1442.5	-	-	-	32.51	-
AVERAGE	-	4.00	-	-	2.70	2.2

* Flow pro-rated on average flow per year

COMMENTS

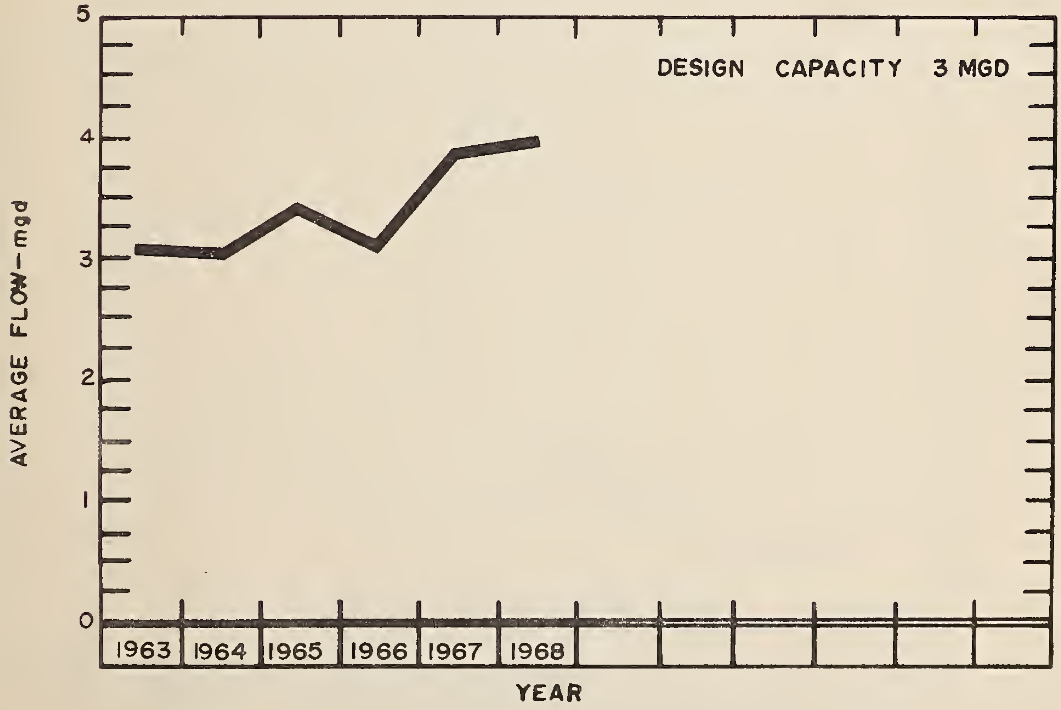
The average daily flow to the plant indicates that the plant was overloaded by 33% of its design capacity. The plot of daily flow probability indicates that the plant was overloaded 95% of the time.

An average chlorine dosage of 2.2 mg/l was applied on a year-round basis to produce the required chlorine residual of 0.5 mg/l.

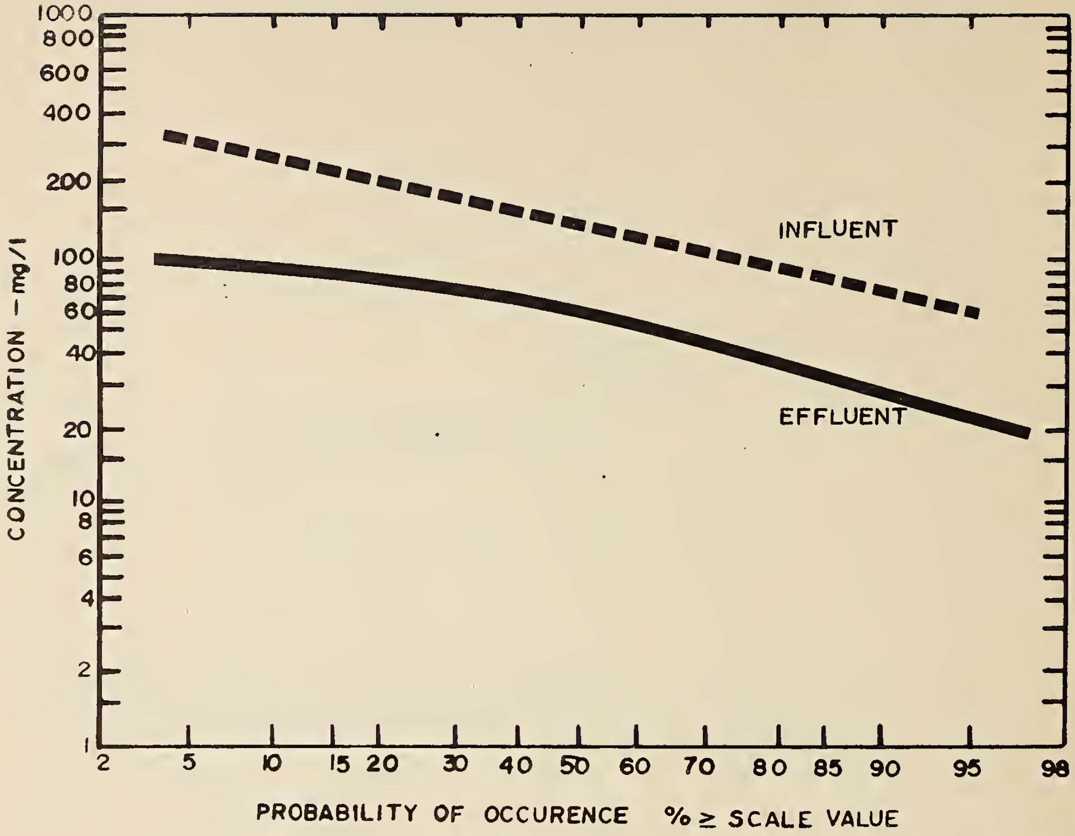


FLOW - mgd
0
1
2
3
4
5
6
7
8
9
10
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE - % ≥ SCALE VALUE

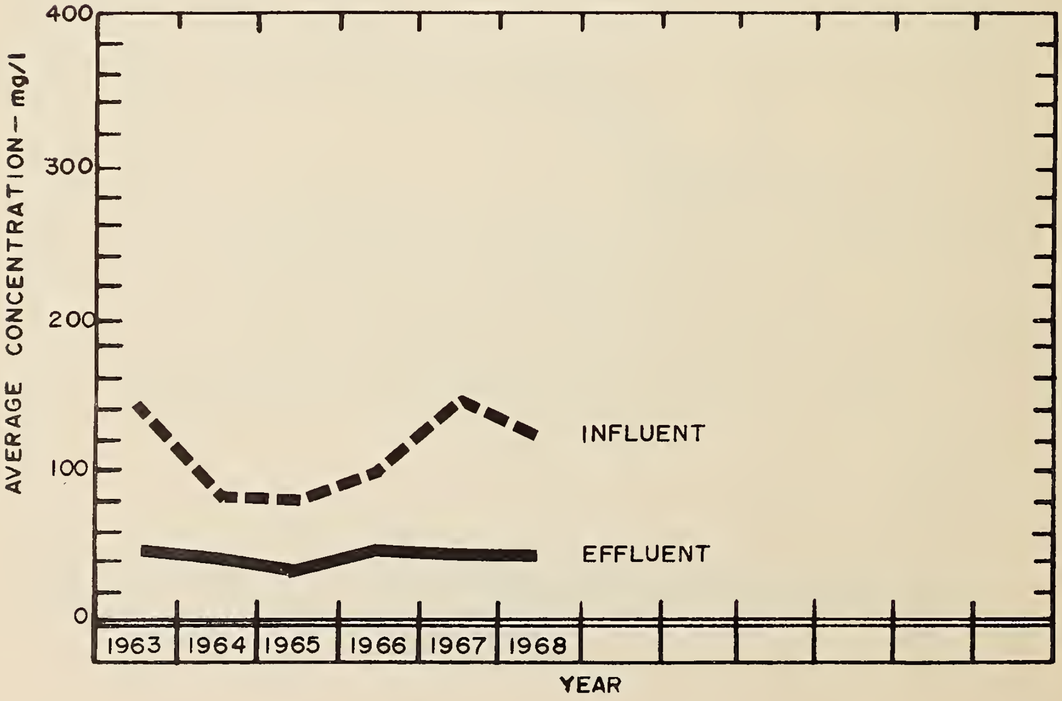
FLOWS

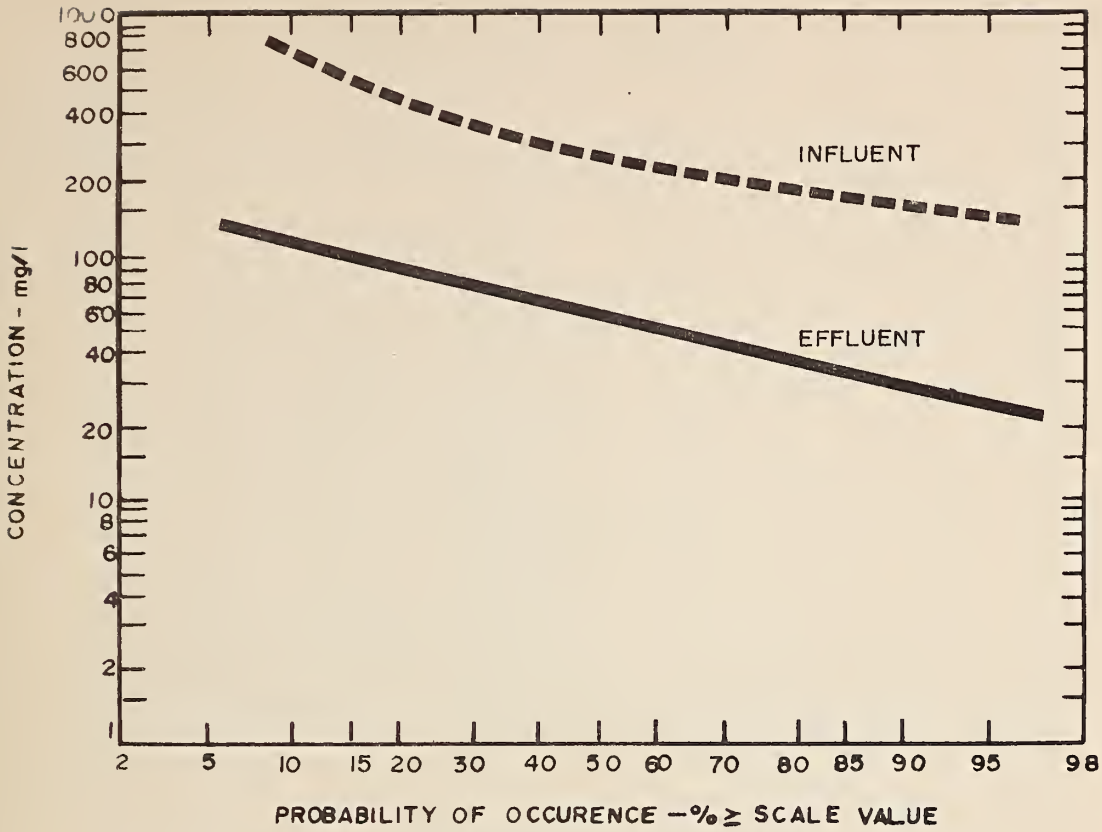


AVERAGE FLOW - mgd
0
1
2
3
4
5
DESIGN CAPACITY 3 MGD
1963
1964
1965
1966
1967
1968
YEAR

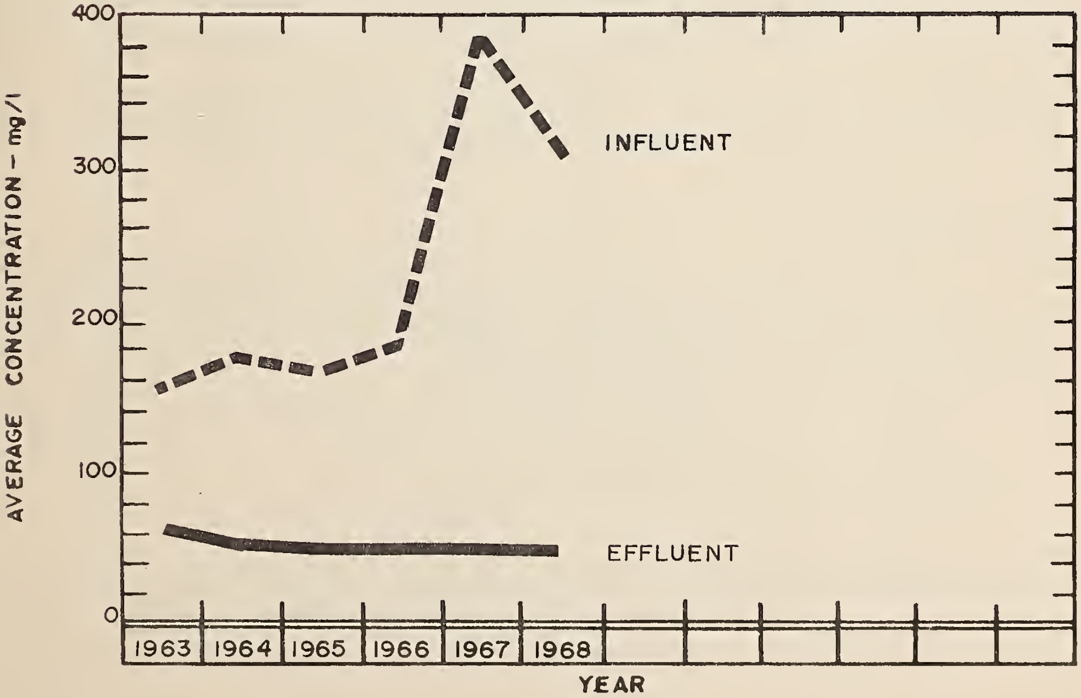


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



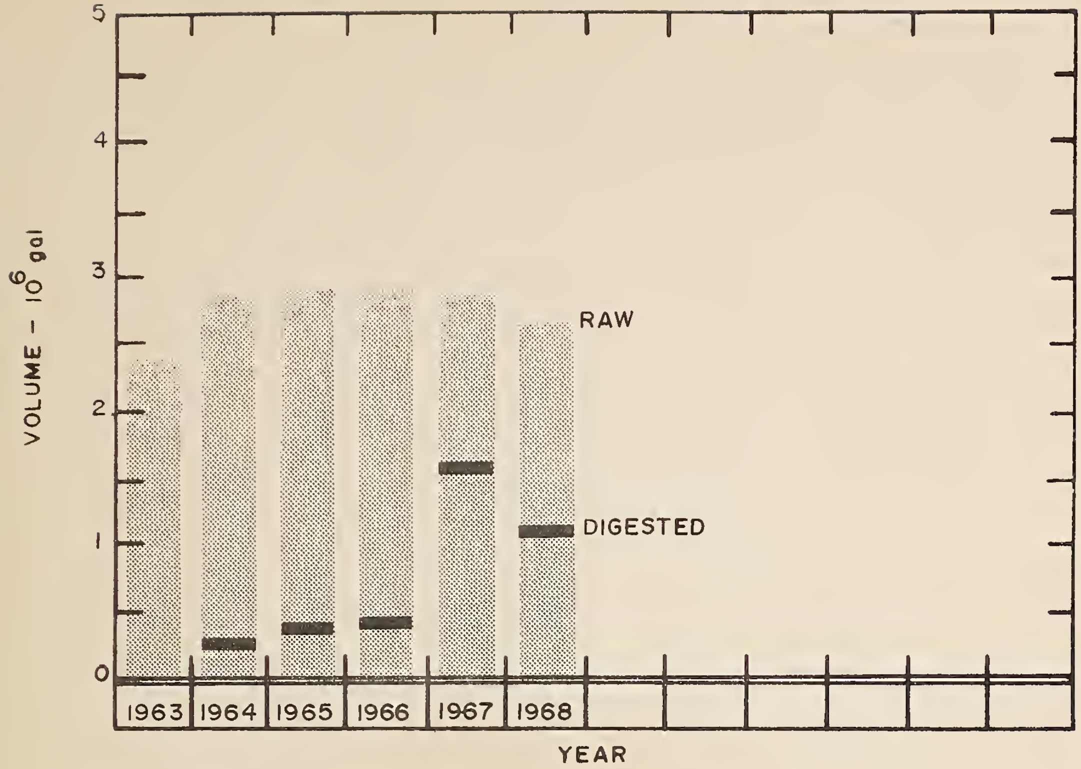
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC^{N} mg/l	EFF CONC^{N} mg/l	RED^{N} %	REMOVAL 10^3 lb	INF CONC^{N} mg/l	EFF CONC^{N} mg/l	RED^{N} %	REMOVAL 10^3 lb	REMOVAL ft^3
JAN	110	33	70	97.7	189	32	83	199.2	54
FEB	133	69	48	88.5	187	52	72	186.7	97
MAR	112	41	63	82.5	480	100	79	441.8	94
APR	81	65	20	19.2	132	54	59	93.6	57
MAY	117	44	62	77.4	275	21	92	269.3	87
JUN	170	84	51	69.6	443	111	75	268.7	61
JULY	84	43	49	42.1	177	71	60	108.8	127
AUG	97	39	60	79.1	197	28	86	230.5	159
SEPT	200	36	82	238.1	1061	49	95	1469.4	57
OCT	160	55	66	118.1	353	29	92	364.6	68
NOV	127	42	67	99.6	176	33	81	167.6	50
DEC	110	20	82	126.3	100	50	50	70.2	156
TOTAL	-	-	-	1138.2	-	-	-	3840.4	1067
AVERAGE	125	48	62	94.9	314	53	83	321.7	89

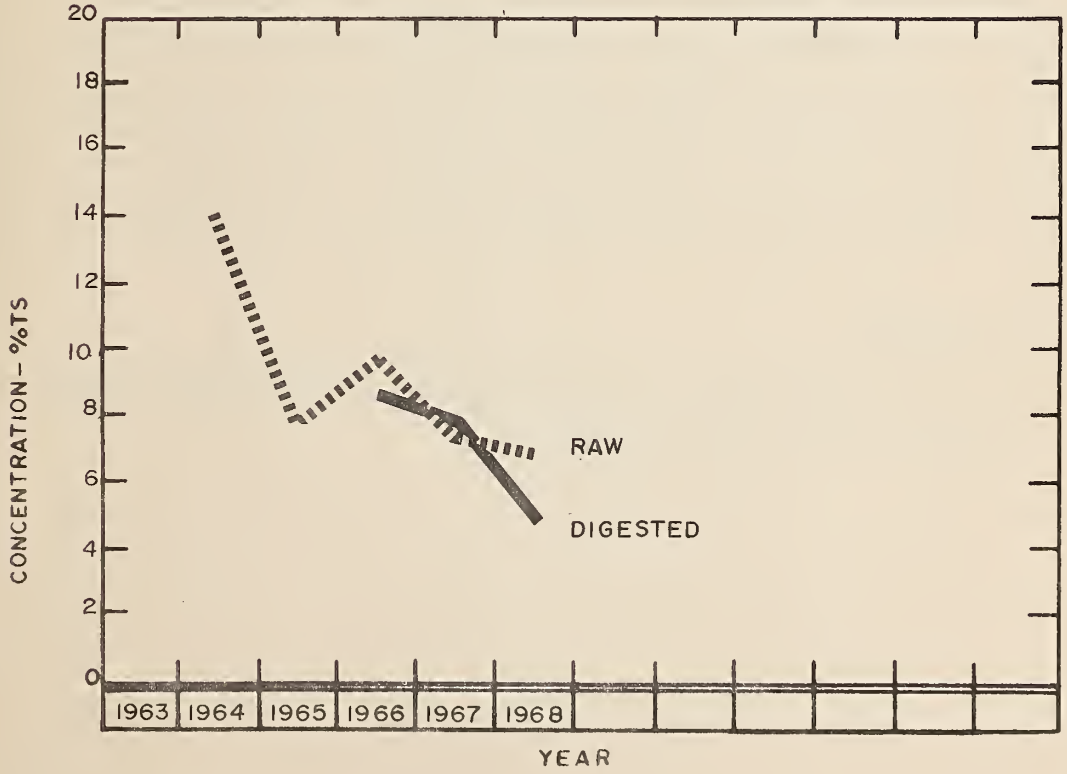
COMMENTS

The strength of the raw sewage dropped slightly with a slight increase in total flow. The final effluent BOD and suspended solids had only small variations from the 1967 values. Considering this, the plant operated at the same efficiency as in 1967.

An average of 89 cubic feet of grit per month was removed from the plant.


VOLUME - 10^6 gal
5
4
3
2
1
0
RAW
DIGESTED
1963
1964
1965
1966
1967
1968
YEAR

DIGESTION


CONCENTRATION - %TS
20
18
16
14
12
10
8
6
4
2
0
RAW
DIGESTED
1963
1964
1965
1966
1967
1968
YEAR

SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10^3 gal	T. S. %	V. S. %	VOLUME 10^3 gal	T. S. %	V. S. %	VOLUME gal	T. S. %	LIQUID yd^3	DEWATERED yd^3
JAN	24.8	7.5	45	27.0	4.1	31	-	-	162	0
FEB	23.2	6.9	47	192.6	4.2	50	-	-	1143	0
MAR	248.0	7.5	47	158.8	-		-	-	945	0
APR	296.0	7.5	60	157.4	1.4	-	-	-	918	0
MAY	248.0	5.7	55	51.4	-	-	-	-	306	0
JUN	248.8	8.2	52	0	-	-	-	-	0	0
JUL	284.0	8.5	42	0	-	-	-	-	0	0
AUG	266.0	10.1	38	120.0	9.2	30	-	-	712	0
SEPT	252.8	6.9	51	114.0	9.5	26	-	-	677	0
OCT	260.0	5.4	54	93.0	6.1	34	-	-	552	0
NOV	240.0	4.5	57	25.5	2.9	33	-	-	151	0
DEC	266.0	4.3	53	112.5	5.4	42	-	-	666	0
TOTAL	2657.6	-	-	1052.2	-	-	-	-	6232	0
AVERAGE	221.5	6.9	50	87.7	4.9	35	-	-	519	0

COMMENTS

A total of 2,657,600 gallons of raw sludge was pumped to the digester in 1968, while 1,052,200 gallons of digested liquid sludge were disposed of by a private sludge hauler.

RECOMMENDATIONS

In 1968, the plant was overloaded hydraulically and organically, with a consequent reduction in efficiency. Owing to flooding in the sewer system, the west side sewage pumping station is being enlarged. However, this will increase the plant's hydraulic overloading.

A storm water separation program should be pursued actively by the city, and the need for plant enlargement should be considered.

Water management in Ontario